Correlation Mining between Digital Rural Policy and Digital Government Policy from a Policy Information Perspective

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Date: 2022-06-14T00:00:00+00:00

Abstract

[Purpose/Significance]Digital villages and digital government, as important components of Digital China, have a complementary relationship; exploring the policy correlation between the two and investigating their similarities and differences in policy content helps promote China' s digital transformation, achieving efficient government services, scientific decision-making models, and refined urban-rural governance. [Method/Process] Based on policy informatics theory, a comparative study is conducted on the textual content of digital village policies and digital government policies, utilizing the grey relational analysis model to calculate the coding results of both. [Results/Conclusion] The correlation between digital village policies and digital government policies is highest in the dimension of digital technology construction, indicating that their policy demands for digital technology construction are most similar; the correlation is lowest in the dimension of economic construction, and the demand for economic construction in digital village policies far exceeds that in digital government policies, indicating that digital village development urgently requires the supporting role of an economic foundation.

Full Text

Mining the Correlation Between Digital Village Policy and Digital Government Policy from the Perspective of Policy Informatics

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Abstract:
[Objective] As integral components of Digital China, digital village and digital government initiatives exhibit complementary synergies. Mining their policy correlations and exploring similarities and differences in policy content can help advance China' s digital transformation, enabling efficient government services, scientific decision-making models, and refined urban-rural governance.
[Methods] Based on policy informatics theory, this study conducts a comparative analysis of digital village and digital government policy texts, employing a grey relational model to calculate correlations between encoded policy elements.
[Results] Digital village and digital government policies show the highest correlation in the digital technology construction dimension and the lowest correlation in economic construction, with digital village policy demonstrating substantially greater demand for economic development than digital government policy.
[Limitations] Policy sample selection was limited to central government documents, and the timeframe for policy selection spans a relatively narrow period.
[Conclusions] Digital village and digital government policies share the most similar requirements regarding digital technology construction. However, compared to digital government, digital village development more urgently requires the supporting role of economic foundations.

Keywords: digital village; digital government; policy informatics; correlation degree mining

1 Introduction

With the development of modern information technology, digital transformation has become an inevitable choice for governments worldwide to enhance decision-making capacity, social governance, and public service efficiency. Many countries have elevated this to a national strategic priority. China' s *14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives Through 2035* (hereinafter referred to as the *14th Five-Year Plan Outline*) systematically outlines and strategically deploys digital transformation, dedicating a separate chapter to "Accelerating Digital Development and Building Digital China" and proposing to "activate the potential of data elements and accelerate the development of the digital economy, digital society, and digital government." The *14th Five-Year Plan Outline* explicitly identifies digital village and digital government construction as vital components of digital transformation and essential elements for building Digital China. Implementing the digital village strategy represents a critical priority for accelerating digital society development, while advancing digital government construction serves as an important means to improve the national governance system and modernize governance capabilities.

Digital villages, as a key content of Digital China construction, represent the strategic direction for implementing rural revitalization. A digital village refers

to the application of digital innovation technologies such as cloud computing and artificial intelligence to traditional agriculture, achieving agricultural datafication, governance datafication, and lifestyle datafication in rural areas [1]. Digital villages aim to reconstruct modern rural economic development patterns and create new models of informatized rural governance [2]. In 2020, China accelerated digital village construction, successively releasing documents such as the *Digital Agriculture and Rural Development Plan (2019–2025)* and *Key Points for Digital Village Development Work in 2020* to facilitate progress [3]. In 2021, the "No. 1 Central Document" explicitly stated the need to "implement digital village construction and development projects," eliminate the urban-rural digital divide, and ensure "priority development of agriculture and rural areas" [4].

Digital government is also a component of Digital China construction and has attracted widespread attention in recent years, becoming a focal issue for all sectors of society. Digital government refers to the process by which government departments use digital thinking and concepts, digital strategies and resources, and digital tools and rules to govern information society space, provide quality government services, and enhance public service satisfaction [5]. The construction objectives of digital government aim to improve governance capabilities in market supervision, social governance, public services, and regional coordination, forming a modern governance model of "data-driven decision-making, data-enabled services, and data-driven innovation" [6]. The Fourth Plenary Session of the 19th CPC Central Committee in 2019 explicitly proposed advancing digital government construction [7] and strengthening orderly data sharing. This marked the first time "digital government" was formally included in Party Central Committee policy documents, signifying that digital government construction has become a key element in building the government governance system [8].

Digital villages and digital government share an inseparable relationship. On one hand, they mutually reinforce each other. Digital government improves service delivery through digital technology, thereby driving the development of digital society and the digital economy, including digital villages. Conversely, digital society and the digital economy, including digital villages, provide a solid foundation for digital government construction. The two support and integrate with each other, ultimately achieving comprehensive transformation in individuals' , enterprises' , and governments' lifestyles, production modes, and governance methods. On the other hand, they each have distinct emphases. The *14th Five-Year Plan Outline* clearly specifies future development directions and priority areas for both digital villages and digital government. Digital villages focus on building comprehensive information service systems oriented toward agriculture and rural areas, establishing inclusive information service mechanisms for agriculture-related information, and promoting digitalization of rural management services. Digital government, meanwhile, emphasizes open sharing of public data, collaborative construction and utilization of government informatization, and enhanced efficiency of digital government services.

Policy informatics theory reveals that government policy formulation, implementation, and scientific research exhibit mutually influential and synergistic relationships [9]. Faced with increasingly complex public management and policy issues, policy informatics integrates information technology and data science to provide new research perspectives, management paradigms, and technical methods, driving policy development from informatization toward intelligence. This approach has garnered significant attention from academia and government departments. Digital village development and digital government construction require not only concerted cooperation between government and all sectors of society but also the establishment of more robust policy formulation and evaluation mechanisms centered on policy as a core variable, while simultaneously presenting new challenges and demands for policy theory, paradigm, and applied research. From historical, present, and developmental perspectives, China' s digital villages and digital government have entered an accelerated development phase, with digital transformation releasing tremendous value and potential. Both digital village development and digital government transformation urgently require the impetus of public policy.

In recent years, central and local governments have issued a series of policies related to digital villages and digital government. While these policies intersect, they differ in construction content and implementation pathways [10]. As vital components of Digital China, digital villages and digital government are both complementary and distinct. Researching the textual correlation between their policies can help achieve efficient government services, scientific decision-making models, and refined urban-rural governance. To mine the content correlations between digital village and digital government policies across various dimensions, this study selects policy texts of equivalent authority levels as samples, extracts several dimensions and elements from the sample content, encodes the policy texts separately, introduces a grey relational model to calculate correlations between the encoded results, and finally analyzes their similarities and differences in conjunction with specific policy content, providing recommendations for China' s digital transformation and advancing the construction of the digital economy, digital society, and digital government.

2 Related Research

Current research on digital village construction primarily focuses on three aspects: connotation, current status, and challenges. Studies on digital village connotation include three perspectives: first, viewing digital villages as a modern agricultural and rural complex led by digital technology and digital industries [11]; second, considering digital villages a new economic form that relies on the digital economy and modern information technology to enhance rural industrial digitization and intelligence levels [12]; and third, recognizing digital villages as an important component of Digital China construction and an extension of smart society in rural development. Research on digital village construction

status concentrates on three areas: first, compared with urban areas, backward network infrastructure and service levels, slower industrial digitization processes, and lagging digital skills training systems [13] limit the penetration and development of digital technology in rural areas; second, China' s current integration of the digital economy with agricultural and rural economic development faces considerable challenges, particularly in digital infrastructure, digital talent cultivation, and data sharing systems [14]; and third, the urban-rural digital divide affects agricultural digital transformation and rural social construction, hindering integrated urban-rural development [15].

Current research on digital government construction has formed a basic framework. First, studies have examined the theoretical foundations of digital government from perspectives including concept and connotation, characteristics and framework, functions and roles, and value creation, with representative theoretical perspectives such as "platform theory," "holistic theory," and "ecosystem theory" [16]. Second, research has analyzed the technical support for digital government from platform construction, data processing and analysis, and digital government services. Third, studies have investigated implementation methods for digital government from institutional mechanisms, innovation models, and realization pathways of intelligent government services. Fourth, research has elaborated on practical applications of digital government construction from implementation processes, deployment schemes, and case studies [17]. Fifth, studies have derived digital government governance models from research on the value of the digital economy and digital society created through digital government participation. China' s digital government construction remains in its initial stages, with considerable room for improvement in governance capabilities [18]. Although digital government construction has attracted significant academic attention and related research is increasing, there remains a lack of sufficient integration and in-depth analysis. Overall, digital villages and digital government have developed multi-perspective theoretical foundations and multi-regional practical application research within their respective fields, but research on their interrelationship remains underexplored and warrants further investigation. This study explores the theoretical correlation between digital villages and digital government and mines the textual correlation of their policies through content analysis and grey system analysis methods, offering certain innovations in research content.

3 Research Design

To classify dimensions and elements of policy sample content, word frequency statistics were conducted on digital government and digital village policy samples as a classification basis. First, all policy sample content for digital government and digital villages was analyzed using Nvivo software for word frequency statistics. Second, minimum word length was set for queries, punctuation and stop words were removed, and synonyms were categorized. Finally, word fre-

quency statistical results were obtained. Based on both word frequency statistical results and after traversing all policy sample content, extracted theme words were combined with sample content to summarize and categorize a policy dimension and element table that nearly comprehensively covers all digital village and digital government policy sample content. The extracted policy dimensions and elements are presented in Table 3 .

The correlation between digital village and digital government policies in the benefit-for-people service construction dimension is 0.59, indicating a moderate correlation level. This dimension includes two elements: information accessibility construction and integrated information services. Promoting benefit-for-people service construction represents an important pathway for enhancing people' s well-being indices.

In digital village policies, requirements include building comprehensive information service systems oriented toward agriculture and rural areas, establishing inclusive service mechanisms for agriculture-related information, promoting digitalization of rural management services, continuously expanding the coverage of "village-level access" to government services, and improving convenience for residents in handling affairs.

In digital government policies, requirements include accelerating information accessibility construction for government affairs, public services, e-commerce, and electronic navigation; popularizing accessibility in internet websites, mobile applications, and self-service public facilities; and incorporating information accessibility levels into civilized city evaluation metrics. Policies also call for accelerating the establishment of a national integrated online government service platform to achieve "one-network 通办" (one-stop online processing) and cross-regional processing, expanding the application scope of electronic licenses and achieving national mutual recognition, with the goal of making 100% of government service items available online.

The correlation between digital village and digital government policies in the economic construction dimension is 0.373, indicating a relatively low correlation level. This dimension includes two elements: industrial digitization and e-commerce. Only through vigorous economic development, increasing national income, and raising total economic output can China' s global standing be enhanced and the nation become stronger overall.

In digital village policies, requirements include leveraging rural advantageous and characteristic resources to promote the establishment of modern agricultural industrial systems, production systems, and management systems; cultivating new industries, new business forms, new models, and new types of agricultural business entities; and promoting effective integration between small farmers and modern agricultural development. Policies also call for cultivating and forming a batch of high-quality rural e-commerce product brands, deepening the 普及 of rural postal and express delivery outlets, forming a rural smart logistics distribution system, and promoting integrated development of online

and offline agricultural product sales channels.

In digital government policies, requirements include advancing digital industrialization and industrial digitization, promoting deep integration between the digital economy and the real economy, and building internationally competitive digital industry clusters. Policies also emphasize cultivating data factor markets, leveraging the key role of data factors, enabling and enhancing data value, continuously strengthening, optimizing, and expanding China' s digital economy, and providing robust economic support for building Digital China.

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6 Analysis and Conclusion

This study' s selection of policy samples was limited to central government documents, and the timeframe for policy selection spans a relatively narrow period. Future research will expand the regional selection scope and temporal distribution interval by incorporating digital village and digital government policies issued by various provinces and municipalities, thereby enhancing research applicability, developmental relevance, and practical utility, strengthening the executability of digital village and digital government policies, and promoting China' s digital rural revitalization and digital government construction.

References

[1] Zhang Hong, Du Kaiwen, Jin Bingyan, Liu Qilei. Research on Influencing Factors of High-Quality Rural Development Under the Digital Village Strategy[J]. Statistics and Decision, 2021, 37(08): 98-102.
[2] Mao Wei, Wang Xian. Research on Rural Information Service Models and Strategies Under the Background of Digital Village Construction[J]. Information Science, 2019, 37(11): 116-
[3] Shen Feiwei, Chen Xiaoling. Maintaining Rurality: Theoretical Elaboration on Realizing the Characteristics of Digital Village Governance[J]. E-Government, 2021(03): 39-48.
[4] Lu Jiutian, Chen Canping. Digital Village Construction in Ethnic Minority Areas: Logical Starting Points, Potential Paths, and Policy Recommendations[J]. Journal of Southwest Minzu University (Humanities and Social Sciences Edition), 2021, 42(05): 154-159.
[5] Chen Zhenming. The Technical Foundation of Government Governance Reform—A Review of Government Reform in the Era of Big Data and Intelligence[J]. Administrative Tribune, 2015, 22(06): 1-9.
[6] Chen Ling, Duan Yaoqing, Wang Bingqing. Analysis of the Coupling Coordination Between Digital Government Construction and Government Open Data[J]. Information Science, 2020, 38(01): 162-168.
[7] Wu Zhigang, Cui Xuefeng, Zhou Liang. Analysis of the Current Status and

Development Trends of Digital Government Construction in China[J]. Modern Industrial Economy and Informatization, 2020, 10(07): 6-9.
[8] Yang Qiaoyun, Liang Shilu, Yang Dan. Digital Inclusion: Practical Exploration and Experience from Developed Countries[J]. Information Studies: Theory and Application, 2022, 45(03): 194-201.
[9] Cao Lingjing, Zhang Zhiqiang. Development and Prospects of Policy Informatics[J]. Library and Information Service, 2021, 65(21): 38-50.
[10] Liu Guobin, Teng Ziyi. Evaluation and Influencing Factors Analysis of Urban-Rural Informatization Integration Development Level[J]. Information Science, 2021, 39(06): 27-35+83.
[11] Wang Tingyong, Yang Li, Guo Jiangyun. Related Issues and Countermeasures for Digital Village Construction[J]. Southwest Finance, 2021(12): 43-55.
[12] Zhu Wei. Analysis on the Development Status and Trends of Rural E-Commerce from the Perspective of Digital Village—Based on 2016-2020 National County-Level Rural E-Commerce Data[J]. Business Economics, 2022(06): 123-126.
[13] Yin Haodong, Huo Peng, Wang Sangui. Digital Transformation of Agriculture and Rural Areas: Realistic Representation, Impact Mechanism, and Promotion Strategies[J]. Reform, 2020(12): 48-56.
[14] Wen Tao, Chen Yiming. Integrated Development of Digital Economy and Agricultural Rural Economy: Practice Models, Realistic Obstacles, and Breakthrough Paths[J]. Issues in Agricultural Economy, 2020(07): 118-129.
[15] Lü Pusheng. Digital Village and Information Empowerment[J]. Social Sciences in Chinese Higher Education Institutions, 2020(02): 69-79+158-159.
[16] Lu Ke, Liang Zhaohong. Process Integration Analysis of Smart Government Services[J]. Chinese Public Administration, 2022(03): 58-64.
[17] Duan Yaoqing, Yao Lan, Yang Shaofei. Research on Extracting Components of Digital Government Construction Based on Grounded Theory[J]. Information Science, 2021, 39(07): 3-9.
[18] Zhang Bin, Yang Wen. Research on Optimizing China' s Government Information Resource Governance System in the Digital Era[J]. Library and Information Service, 2020, 64(11): 3-10.
[19] Zhou Wenhao, Zeng Bo. A Review of Grey Relational Degree Models[J]. Statistics and Decision, 2020, 36(15): 29-34.
[20] Liu Sifeng, Dang Yaoguo, et al. Grey System Theory and Its Applications (5th Edition)[M]. Beijing: Science Press, 2010.
[21] Shen Xinyi, Lin Shiyuan, Chen Li. Coding and Analysis of Modern Distance Education Policy in China[J]. Modern Distance Education Research, 2014(05): 62-70.
[22] State Council Notice on Issuing the 14th Five-Year Plan for Disability Prevention and Rehabilitation Development[J]. Gazette of the State Council of the People' s Republic of China, 2021(22): 25-38.
[23] Wang Piyi. Information Exchange Promotes In-Depth Development of District-Level E-Government[J]. Shanghai Informatization, 2007(02): 72-73.
[24] Fang Kun, Li Fan, Jin Ming. Research on Digital Village Public Service System Based on Holistic Governance[J]. E-Government, 2019(11): 72-81.

[25] Liu Guobin, Qi Boyang. Research on the Integrated Development of County-Level Urban Intelligence and Informatization[J]. Information Science, 2022, 40(03): 21-26.
[26] Zhang Xiaolian. Promoting "Four Modernizations" Collaborative Linkage to Promote Comprehensive Rural Revitalization[J]. Chinese People' s Political Consultative Conference, 2020(17): 44-45.
[27] Ouyang Rihui. Digitalization is an Important Engine for China' s Economic and Social Development Under the New Situation[J]. State Governance, 2020(41): 44-48.
[28] Zhang Jianbin. Research on the Fairness of Grassroots Government Public Information Services[J]. Library and Information Service, 2011, v.55; No.440(19): 120-124.
[29] Sun Guicai. Development Path of Weifang' s "Internet + Agriculture" Under the Digital Village Strategy[J]. Economic Management Digest, 2021(01): 161-162.
[30] Du Weiquan. Research on Digital Transformation of Grassroots Social Governance—Based on Analysis of Practical Experience in M City, Eastern China[J]. Information Studies: Theory and Application, 2021, 44(02): 109-114+63.

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Author Contribution Statement:
Jin Mengrui: Responsible for data collection, data analysis, and initial manuscript writing;
Chen Ling: Responsible for in-depth revision of the full paper;
Duan Yaoqing: Responsible for topic selection, outline development, and providing revision suggestions.

Note: Figure translations are in progress. See original paper for figures.